CBCS SCHEME

USN | | | | | | | | | | |

17MT46

Fourth Semester B.E. Degree Examination, Jan./Feb. 2021
Instrumentation and Measurement

Time: 3 hrs. Max. Marks: 100

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. Explain defection and null type instruments giving suitable examples and state the difference between them. **(10 Marks)**

b. Explain active and positive transducers with suitable examples. **(10 Marks)**

OR

2 a. Explain how the effect of modifying and interfacing inputs is minimized/eliminated in measurement system with suitable example. **(10 Marks)**

b. Explain the analog and digital modes of operation of instruments. Also explain how the resolution of digital instruments can be increased. **(10 Marks)**

Module-2

3 a. Define:
i) Accuracy ii) Precision iii) Resolution
iv) Sensitivity v) Linearity vi) Error **(12 Marks)**

b. Explain the phenomenon of hysteresis in measurement systems also explain the terms 'threshold', 'dead zone', 'dead time'. **(08 Marks)**

OR

4 a. Derive the response of a first order system to step input in detail. **(10 Marks)**

b. Derive the response of a second order system when subjected to step input. **(10 Marks)**

Module-3

5 a. Explain the Hall effect devices with principle. Derive expression for hall filed and velocity. **(10 Marks)**

b. Explain variable capacitance transducer devices with example. **(10 Marks)**

OR

6 a. Explain differential pressure level detector for level measurement with a neat diagram. **(10 Marks)**

b. Explain ultrasonic level detector with a neat diagram. **(10 Marks)**

Module-4

7 a. Explain with a diagram the working of semiconductor strain gauge and also state its advantages and disadvantages. **(10 Marks)**

b. Explain the working of Wein's bridge and derive the balanced equation for it. **(10 Marks)**

OR

8 a. Explain the principle of operation of Kelvin's bridge in detail. **(10 Marks)**

b. Explain the working of a resistance wire gauge. **(10 Marks)**

Module-5

9 a. Explain in detail the working of piezoelectric and photoelectric transducer with circuit. **(10 Marks)**

b. Explain the working principle of thermistors and resistance thermometer briefly. **(10 Marks)**

OR

10 a. Explain in detail the working principle of thermocouple and Resistance Temperature Detector (RTD) briefly. **(10 Marks)**

b. Explain with diagram the construction, principle and working of LVDT. **(10 Marks)**

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